

WHAT IS CLAIMED IS:

1. An integrated circuit, comprising:

an injection-molded substrate having top channels for
addition of circuit material, the top channels having sides
5 extending to a plane defining a top surface of the
substrate and a bottom beneath the plane;

a die mounted to the substrate;

a plurality of electrical terminals mounted to the
substrate for connecting the die to external circuits; and

10 circuit material deposited within the channels for
forming an electrical connection between the die and the
electrical terminals.

2. The integrated circuit of Claim 1, wherein the substrate
5 further has bottom channels having sides extending to a bottom
plane defining a bottom surface of the substrate and a top
beneath the bottom plane, and wherein the circuit material is
further deposited within the bottom channels.

20 3. The integrated circuit of claim 2, wherein the circuit
material connects circuit material within top channels and
circuit material within bottom channels through molded voids in
said injection-molded substrate.

4. The integrated circuit of Claim 2, wherein said voids have a substantially conical shape to promote plating growth through said voids.

5 5. The integrated circuit of Claim 1, further comprising at least one other die mounted on the substrate, and wherein the circuit material further forms electrical connections between the die and the at least one other die.

00 6. The integrated circuit of Claim 1, wherein the substrate and the circuit material form die connection pads for solder-ball mounting of the die to the substrate.

15 7. The integrated circuit of Claim 6, wherein the circuit material further forms wire bond pads for attaching wire-bond connections from the die.

20 8. The integrated circuit of Claim 1, further comprising a solderable plating layer deposited over the circuit material for preventing oxidation of the circuit material.

9. The integrated circuit of Claim 1, wherein the circuit material forms wire bond pads for attaching wire-bond connections from the die.

10. The integrated circuit of Claim 9, wherein the substrate includes a well for mounting the die and wire-bond pads on a top side of the substrate, and wherein the wire-bond connections extend from the top of the die to the wire bond pads.

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11. The integrated circuit of Claim 1, further comprising a conductive sheet on the bottom of the substrate, and where the circuit material connects circuit material within top channels with the conductive sheet.

12. An integrated circuit, comprising:

an injection-molded substrate;

a die mounted to the substrate;

a plurality of electrical terminals mounted to the

substrate for connecting the die to external circuits; and

means for electrically connecting the die to the plurality of electrical terminals.

13. A method for manufacturing an integrated circuit substrate,
comprising:

injection-molding a substrate with a tool having features
defining a reverse image of channels for addition of circuit
5 material; and

adding circuit material within channels formed by the
embossing.

14. An integrated circuit manufactured by the method of Claim
13.

15. The method of Claim 13, wherein said tool has features for
defining channels on a top side and a bottom side of said
substrate, and wherein said injection-molding molds a substrate
having channels on a top side and a bottom side, and wherein
said adding adds circuit material on said top side and said
bottom side.

16. The method of Claim 15, wherein the tool has features for
creating voids through the substrate from the top side channels
to the bottom side channels, and wherein the method further
comprises depositing circuit material within the voids for
electrically connecting circuit material within the top side
channels to circuit material within the bottom side channels.

17. The method of Claim 13, further comprising mounting a die having electrical contacts on a bottom side by soldering said die to the channels.

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18. The method of Claim 13, wherein the adding is performed by electroplating copper on the top side of the substrate and wherein the method further comprises:

depositing a resist material on top of areas of the circuit material; and

etching the electroplated copper to form an electrical circuit within the areas.

19. A tool for injection-molding a substrate material for mounting an integrated circuit, whereby channels for addition of circuit material may be formed on a top side of the substrate material, wherein the tool comprises:

a thin metal tool foil stamped with features defining a reverse image of the channels;

a machine for supporting the thin metal tool foil such that the substrate material can be injected; and

a molding surface for retaining said substrate material against said thin metal tool foil to form the channels.

20. The tool of Claim 19, wherein said molding surface is a thin metal tool foil stamped with features defining a reverse image of a bottom side of said substrate.